

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-60 (canceled)

61 (previously added). A method for screening members of a combinatorial library, the method comprising
simultaneously flowing a test fluid through six or more vessels, each of the six or more vessels comprising a member of the combinatorial library,
controlling the flowrate of the test fluid to be about the same in the six or more vessels by simultaneously flowing the test fluid through six or more flow restrictors, each of six or more flow restrictors providing fluid communication between one of the six or more vessels and (i) an entrance control volume, or alternatively, (ii) an exit control volume,
simultaneously contacting at least six of the six or more library members with the test fluid in the six or more vessels,
simultaneously detecting changes in the test fluid following contact with each of the six or more library members, and
correlating the changes in the test fluid to a property of each of the six or more library members.

62 (currently amended). A method for screening catalysts for a reaction of interest, the method comprising
simultaneously feeding one or more reactants through six or more reaction vessels, each of the six or more vessels comprising a different candidate catalyst,
controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels by
simultaneously flowing the one or more reactants through six or more flow restrictors, each of the six or more flow restrictors providing fluid communication between one of the six or more

reaction vessels and (i) an entrance control volume, **and additionally** or alternatively, (ii) an exit control volume, simultaneously contacting the candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, and simultaneously detecting resulting reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates.

63 (previously added). The method of claims 61 or 62 wherein the resistance to fluid flow within a given flow channel is greatest in the flow restrictor, and the resistance to flow in each of the six or more flow restrictors is approximately the same, such that maintaining a higher pressure in the entrance control volume than in the exit control volume results in simultaneous fluid flow through the at least six vessels that is apportioned approximately equally between each of the at least six vessels.

64 (previously added). The method of claims 61 or 62 wherein each of the six or more flow restrictors provide fluid communication between one of the six or more reaction vessels and an entrance control volume.

65 (currently amended). A method for screening catalysts for a reaction of interest, the method comprising feeding one or more reactants through one or more distribution valves to six or more reaction vessels, the one or more reactants being fed simultaneously to at least two of the reaction vessels, each of the six or more vessels comprising an inlet in fluid communication with an entrance control volume, an outlet in fluid communication with an exit control volume, and a different candidate catalyst in the reaction vessel, the one or more distribution valves providing selective fluid communication between the entrance control volume and the six or more reaction vessels,

contacting the six or more different candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, at least two different candidate catalysts being contacted simultaneously with the one or more reactants in the at least two reaction vessels into which the one or more reactants are fed simultaneously,

discharging reaction products and unreacted reactants, if any, from the six or more reaction vessels, through one or more selection valves to one or more detectors, the one or more selection valves providing selective fluid communication between the six or more reaction vessels and the one or more detectors, reaction products or unreacted reactants being discharged simultaneously from the at least two reaction vessels into which the one or more reactants are fed simultaneously,

controlling the contact time to be about the same for each of the six or more candidate catalysts by synchronized operation of one or more distribution valves and the one or more selection valves, and

detecting resulting reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates, the resulting reaction products or unreacted reactants discharged simultaneously from the at least two vessels being detected simultaneously.

66 (previously added). The method of claim 65 further comprising controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels.

67 (previously added). The method of claim 65 further comprising controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels by flowing the one or more reactants through six or more flow restrictors, each of six or more flow restrictors providing fluid communication between one of the six or more vessels and (i) the

one or more distribution valves, or alternatively, (ii) the one or more selection valves.

68 (previously added). The method of claim 67 wherein the resistance to fluid flow within a given flow channel is greatest in the flow restrictor, and the resistance to flow in each of the six or more flow restrictors is approximately the same, such that maintaining a higher pressure in the entrance control volume than in the exit control volume results in fluid flow through the at least six vessels that is apportioned approximately equally between each of the at least six vessels.

C2
69 (previously added). The method of claim 67 wherein each of the six or more flow restrictors provide fluid communication between one of the six or more reaction vessels and the one or more distribution valves.

70 (previously added). The method of claim 65 further comprising controlling the flowrate of the one or more reactants with to be about the same in the six or more reaction vessels by flowing the one or more reactants through one or more flow regulators.

Claim 71 (canceled)

72 (previously amended). A method for screening catalysts for a reaction of interest, the method comprising

simultaneously feeding one or more reactants through six or more reaction vessels, each of the six or more vessels comprising an inlet in fluid communication with an entrance control volume, an outlet in fluid communication with an exit control volume, and a different candidate catalyst in the reaction vessel,

controlling the flowrate of the one or more reactants to be about the same in the six or more vessels by simultaneously flowing the reactants through the six or more flow restrictors, each of six or more flow restrictors providing fluid

communication between one of the six or more vessels and the entrance control volume,

contacting the six or more different candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, and

detecting the reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates.

Claims 73-81 (withdrawn)

82 (previously added). The method of claim 61 wherein the time from initial contact of a library member with the test fluid to detection of changes in the test fluid is approximately the same for each of the plurality of confined library members.

83 (previously added). The method of claim 61 wherein the detecting step determines changes in the composition of the test fluid.

84 (previously added). The method of claim 61 wherein the detecting step determines changes in the composition of the test fluid using gas chromatography, mass spectrometry, visible spectrometry, ultraviolet spectrometry, ultraviolet spectrometry or infrared spectrometry.

85 (previously added). The method of claim 61 wherein the six or more library members are at least forty-eight library members.

86 (previously added). The method of claim 61 wherein the total time to screen the six or more library members is less than about six minutes.

87 (previously added). The method of claim 61 wherein the total time to screen the six or more library members is less than about three minutes.

88 (previously added). The method of claim 61 wherein the six or more library members are at least forty-eight library members and the total time to screen the at least forty-eight library members is less than about forty-eight minutes.

89 (previously added). The method of claim 61 wherein the six or more library members are at least forty-eight library members the total time to screen the at least forty-eight library members is less than about twenty-four minutes.

90 (previously added). The method of claim 61 wherein the six or more library members are exposed to a uniform temperature or a temperature gradient during the test.

91 (previously added). The method of claim 61 wherein about the same amount of each of the plurality of library members are present in the respective vessels.

92 (previously added). The method of claim 61 wherein the test fluid is a gaseous test fluid.

93 (previously added). The method of claim 61 wherein the test fluid is a liquid test fluid.

94 (previously added). The method of claim 61 wherein the library member is a solid.

95 (previously added). The method of claim 61 wherein the library member is a liquid.

96 (previously added). The method of claim 61 wherein the test fluid is a gaseous test fluid during the reaction of interest and the library member is a solid.

97 (previously added). The method of claim 61 wherein the test fluid is a gaseous test fluid and the library member is a liquid.

98 (currently amended). A method for screening catalysts for a reaction of interest, the method comprising simultaneously feeding one or more reactants through six or more reaction vessels, each of the six or more vessels comprising a different candidate catalyst,

controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels by simultaneously flowing the one or more reactants through six or more flow restrictors, the flow restrictors being capillary tubes or micromachined channels, each of the six or more flow restrictors providing fluid communication between one of the six or more reaction vessels and (i) an entrance control volume, **and additionally** or alternatively, (ii) an exit control volume,

contacting the candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, and

detecting resulting reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates.

99 (previously added). The method of claims 72 or 98 further comprising

discharging reaction products and unreacted reactants, if any, from the six or more reaction vessels, and

sampling the discharged reaction products or unreacted reactants with a sampling probe, the sampling probe being in fluid communication with one or more detectors.

100 (previously added) The method of claims 62, 72 or 98 wherein the time from initial contact of a catalyst with the reactants to detection of the reaction products or unreacted reactants is approximately the same for each of the plurality of catalysts.

101 (previously added). The method of claims 62, 72 or 98 wherein the detecting step determines the reaction products or unreacted reactants using gas chromatography, mass spectrometry, visible spectrometry, ultraviolet spectrometry, ultraviolet spectrometry or infrared spectrometry.

102 (previously added). The method of any of claims 62, 72 or 98 wherein the six or more catalysts are exposed to a uniform temperature or a temperature gradient.

103 (previously added). The method of any one of claims 62, 72 or 98 wherein the catalysts are confined in the reaction vessels in the form of fixed beds.

104 (previously added). The method of any one of claims 72 or 98 wherein the fluid handling system comprises

a selection valve providing selective fluid communication between a selected vessel and the detector, such that the reaction products or unreacted reactants can be sequentially directed from the selected vessel to the detector, and

a fluid distribution valve providing selective fluid communication between the entrance control volume and the inlet of a selected vessel, such that the reactants can be directed into the selected vessel,

the method further comprising synchronizing the fluid distribution valve and the selection valve such that a time interval between the initial contact of the test fluid with a library member and detection of the test fluid is about the same for each of the plurality of library members.